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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,800	08/17/2006	Youji Inoue	U 016441-4	2403

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EXAMINER	
SUCH, MATTHEW W	
ART UNIT	PAPER NUMBER
2891	
MAIL DATE	DELIVERY MODE
03/25/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,800	INOUE ET AL.	
	Examiner	Art Unit	
	Matthew W. Such	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Amendments to the specification were received on 8 January 2008. These amendments are acceptable and have been entered since all amended subject matter is already supported by disclosure as originally filed.

Claim Objections

2. Claim 15 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim requires that the temperature of the substrate is controlled to 30-65 degrees Celsius and tetradecafluoropentacene is "the formula fluorinated acene compound". However, claim 11 (from which claim 15 depends) already requires the temperature of the substrate controlled to 30-65 degrees Celsius and tetradecafluoropentacene.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 14 and 15 each are drawn to a device, quoting: "The organic

thin-film transistor as claimed in claim 11". However, claim 11 is drawn to a method, quoting: "A method of fabricating an organic thin-film transistor". As such, claims 14 and 15 are indefinite because it is unclear exactly what is being claimed.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 13 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al. (Suzuki et al., Proc. 2003 MRS Fall Meeting, K10.52 as provided in the Information Disclosure Statement). Suzuki et al. disclose synthesis and properties of perflouorinated pentacene ($C_{22}F_{14}$), as the n-type semiconductor material in organic field effect transistors, OFETs (see section K10.52 of MRS Fall 2003 Symposium Program: "Symposium K: Functional Organic Materials and Devices"). Organic field effect transistors must have a gate electrode, source electrode, drain electrode, and gate insulating film in order to be an organic field effect transistor. Without any of these elements, the structure is not an organic field effect transistor.

The language, term, or phrase "controlling temperature of the substrate and vacuum-depositing on", is directed towards the process of making an OFET. It is well settled that "product by process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. In re *Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, In re

Brown, 173 USPQ 685; In re *Luck*, 177 USPQ 523; In re *Fessmann*, 180 USPQ 324; In re *Avery*, 186 USPQ 161; In re *Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re *Marosi* et al., 218 USPQ 289; and particularly In re *Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. The above case law further makes clear that applicant has the burden of showing that the method language necessarily produces a structural difference. As such, the language "controlling temperature of the substrate and vacuum-depositing on" only requires an OFET, which does not distinguish the invention from Suzuki, who teaches the structure as claimed.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 11 and, in so far as definite, claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (Suzuki et al., Proc. 2003 MRS Fall Meeting, K10.52 as provided in the Information Disclosure Statement) in view of Shtein (`586).

Suzuki et al. disclose synthesis and properties of perflouorinated pentacene ($C_{22}F_{14}$; otherwise known as tetradecafluoropentacene), as the n-type semiconductors for OFETs (see section K10.52 of MRS Fall 2003 Symposium Program: "Symposium K: Functional Organic Materials and Devices") but does not recite that the material is formed by controlling the temperature of the substrate to 30 degrees Celsius or higher and 65 degrees Celsius or lower in a vacuum. However, Shtein discloses organic film growth at a substrate temperature of 50 degrees Celsius and at a pressure of 8 Torr (see e.g. [0010]). Therefore it would have been obvious to a person of ordinary skill in the art at the time of the invention to have deposited the perfluoropentacene of Suzuki et al. at a temperature of 50 degrees Celsius and pressure of 8 Torr (less than standard ambient pressure, and hence a vacuum) as taught by Shtein so as to form highly ordered polycrystalline organic thin films that exhibit competitive performance characteristics such as carrier mobility, on/off ratio, threshold voltage and subthreshold slope (see Shtein at paragraph [0010]). Furthermore, Suzuki recognizes that OFETs advantageously contain crystalline organic semiconductor materials. Organic field effect transistors must have a gate electrode, source electrode, drain electrode, and gate insulating film in order to be an organic field effect transistor. Without any of these elements, the structure is not an organic field effect transistor.

9. Claims 11-12 and, in so far as definite, claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (Annual Review 2003 publication; provided to Applicant with Office Action dated 7 September 2007) in view of Shtein (`586).

Sakamoto et al. discloses both perfluorotetracene ($C_{18}F_{12}$; otherwise known as dodecfluoronaphthacene) and perflouorinated pentacene ($C_{22}F_{14}$; otherwise known as tetradecafluoropentacene) for use as an n-type semiconductor in OFETs (see page 243 of Annual Review 2003 publication) but does not recite that the material is formed by controlling the temperature of the substrate to 24 degrees Celsius or higher and 60 degrees Celsius or lower in a vacuum. However, Shtein discloses organic film growth at a substrate temperature of 50 degrees Celsius and at a pressure of 8 Torr (see e.g. [0010]). Therefore it would have been obvious to a person of ordinary skill in the art at the time of the invention to have deposited perfluorotetracene or perflouorinated pentacene of Sakamoto at a temperature of 50 degrees Celsius and pressure of 8 Torr (less standard ambient pressure, and hence a vacuum) as taught by Shtein so as to form highly ordered polycrystalline organic thin films that exhibit competitive performance characteristics such as carrier mobility, on/off ratio, threshold voltage and subthreshold slope (see Shtein at paragraph [0010]). Organic field effect transistors must have a gate electrode, source electrode, drain electrode, and gate insulating film in order to be an organic field effect transistor. Without any of these elements, the structure is not an organic field effect transistor.

Response to Arguments

10. Applicant's arguments filed 8 January 2008 have been fully considered but they are not persuasive. The Applicant argues that none of the references show fluorinated acene compounds on a substrate to form organic thin films with desired orientation formed by vacuum deposition. This is not persuasive for at least the following reasons. Firstly, all of the Applicant's arguments

are directed to the reference of Shtein (`586). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Second, the Applicant argues that a pressure of 8 Torr is not a vacuum. The Applicant then asserts that "vacuum deposition is normally conducted at a pressure equal to or les than 10^{-4} Pa" (Remarks Page 9, Lines 12-14). In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "vacuum deposition is normally conducted at a pressure equal to or les than 10^{-4} Pa") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). As such, because 8 Torr is a vacuum because it is less than standard ambient pressure (which is about 760 Torr).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

i. Begley (`450),

ii. Smith (`365), and

iii. Igarashi (`482) each teach fluorinated pentacene and naphthacene.

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew W. Such whose telephone number is (571) 272-8895. The examiner can normally be reached on Monday - Friday 9AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew W. Such/
Examiner, Art Unit 2891

MWS
3/19/08

/BRADLEY W BAUMEISTER/

Supervisory Patent Examiner, Art Unit 2891